

Letters

The Shuttle and Space Science

Colin Norman's article "The science budget: A dose of austerity" (News and Comment, 15 Feb., p. 726) restates the "truth" that "development of the space shuttle curbed space science in the 1970's."

However, Kenneth J. Frost and Frank B. McDonald, in their article "Space research in the era of the space station," (21 Dec., p. 1381) illustrate in their figure 2 that during the 1970's the fraction of the NASA budget allocated to space science increased steadily relative to all other NASA programs. The content of that science program was dramatically different from the program during the 1960's in that it had a few very large projects rather than many smaller ones; but that choice was made within the science community and was not imposed on it by others.

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Space-Based Astronomy

M. Mitchell Waldrop's article (Research News, 18 Jan., p. 283) about astronomy and the realities of the budget is welcome. Astronomers are eager to exploit the opportunities offered by new techniques in both ground- and space-based astronomy for understanding the universe. They are particularly concerned, as Waldrop points out, that both the Advanced X-ray Astrophysics Facility (AXAF) and the Space Infrared Telescope Facility (SIRTF) be developed by NASA in a timely fashion, to capitalize on the discoveries made by earlier, shorter duration x-ray and infrared missions and to complement the work done by other astronomical facilities. When used together with the Hubble Space Telescope and the Gamma-Ray Observatory, which are already under development, AXAF and SIRTF will allow coverage with space-based instruments of all wavelengths from gamma rays to infrared waves. This awesome capability will enable sensitive observations to be made of astronomical phenomena ranging in

temperature from 10 degrees above absolute zero to over 10^{14} degrees and in character from comets to quasars. Both SIRTF and AXAF were highly recommended in the report of the National Academy of Sciences' Astronomy Survey Committee, and both should be funded. To achieve this great advance, astronomers know that they must cooperate fully with each other and with NASA to keep the costs of the new missions under strict control.

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Alcoholism Research

Constance Holden's article "ADAMHA funding pressed" (News and Comment, 11 Jan., p. 147) was most welcome in drawing attention to the opportunities and needs of the research areas represented by the three institutes of the Alcohol, Drug Abuse, and Mental Health Administration. Holden also presents several opinions regarding possibilities of combining the National Institute on Alcohol Abuse and Alcoholism and the National Institute on Drug Abuse into one institute. Although I agree with the validity of examining common mechanisms that may be important in the etiology of alcohol and drug "dependence," several caveats should be mentioned.

The consideration of alcohol as just another "addictive" substance overlooks important issues such as the extent and legality of use of this agent in our society. More important, the profound involvement of alcohol in the nutritional status of a drinking individual clearly distinguishes alcohol from other drugs of abuse. Research on nutrition and the aberrations in nutritional status that contribute to alcohol-induced pathology has in the past been, and should continue to be, an important function supported by NIAAA. Two other areas in which alcohol can be distinguished from many other addictive drugs are (i) alcohol's mech-

anism of action which, on a molecular level, does not appear to involve a specific receptor for ethanol; and (ii) the clear demonstration of genetically determined factors that predispose an individual to alcoholism. Predisposing genetic factors for the development of addiction to other drugs have not been firmly established.

By promoting appropriate collaborative efforts, yet maintaining full cognizance of the substantive differences between alcohol and other drugs, we can avoid compromising the formulation of appropriate research questions and scarce resources will not be wasted on inappropriate research. The maintenance of current institute divisions at least reminds us of some of the distinctive features of alcohol and other abused substances.

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Photovoltaic Energy

Colin Norman's article "A cloudy forecast for solar cells" (News and Comment, 19 Oct., p. 319) has a somewhat different implication from what is suggested in its headline.

The Japanese are now *making* solar cells for between \$3 and \$4 per watt. This means that gaseous hydrogen can be produced by water electrolysis at a price equivalent, in terms of energy, to \$3 per gallon of gasoline (assuming 8 hours per day of sun).

The mass production of such cells is sufficiently far away for this price to be extremely interesting. If we follow the prediction of Zoltan Kiss, president of the Chronar Corporation (and it is a prediction that is by no means alone in the industry), the production of solar cells will cost 50¢ a watt by 1990. Hydrogen could then be produced at a price equivalent, in terms of energy, to 50¢ per gallon of gasoline.

With these figures, I do not think there should be anything cloudy about the future of photovoltaic electricity.

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Erratum: In Constance Holden's briefing "Garrison compromise proposed" (News and Comment, 11 Jan., p. 152), the second sentence of the second paragraph should have read, "Total irrigated acreage, authorized at 250,000, would be reduced to 130,000, including 17,000 acres of Indian reservation to compensate for lands inundated by the Garrison Dam in 1953."